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EXAMINER	
JERABEK, KELLY L	

ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 02/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/737,965	SEEGER ET AL.	
	Examiner	Art Unit	
	Kelly L. Jerabek	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-7,10,11 and 16-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-7, 10-11, 16-21, 23, and 25-28* is/are rejected.

7)☒ Claim(s) *22 and 24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 November 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/1/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 10, 16, and 25 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments, see amendment page 8, filed 11/2/2004 with respect to figures 1-3 have been fully considered and are persuasive. The objection of figures 1-3 has been withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-4, 10-11, 16, 20, and 25 rejected under 35 U.S.C. 103(a) as being unpatentable over Mancuso et al. US 6,618,511 in view of Sussman et al. US 5,686,960.

Re claim 10, Mancuso discloses in figure 1 a digital still camera (100) capable of performing image stitching (col. 7, lines 16-19). The camera (100) includes a variable focus mechanism (optical lenses (102) for auto-focus) for capturing a series of images at different focus distances (col. 7, lines 19-23). The driver and actuator (104) serve as a controller to control the variable focus mechanism (102). The camera (100) takes a series of images (fig. 3: 300) and joins them together to form a panoramic image (col. 8, lines 33-36). Figure 21 is a detailed diagram of a picture-stitching device (124) shown in figure 1. The picture-stitching device (124) shown in figure 21 includes a geographic mapping section (416) and an alignment preview section (2104) (col. 13, lines 41-65). Perspective correction is performed in the alignment preview section (2104) by correcting the perspective of the overlap region (2306) of the Previous Picture (2302) to conform with the perspective of the Current Picture (2304) (col. 14, lines 24-67; col. 15, lines 1-32.; fig. 23). Therefore, a perspective correction device (2104) determines a geometric transform to correct the image segments for perspective distortion. Figure 40 is a block diagram of the stitching and blending architecture (2110) of figure 21. It can be seen that an image compositor is used for compositing a perspective corrected image to which a geometric transform is applied (col. 22, lines 50-57; figs. 40 and 41). However, Mancuso fails to explicitly state that the apparatus includes a variable zoom mechanism for varying the zoom setting of the image capture device and a controller for controlling the different zoom settings. Although Mancuso discloses all of the above limitations he fails to distinctly state that the plural image segments that are sent to the

image compositor are captured at different focus distances and zoom settings and that the focus settings and zoom settings are varied in combination.

Sussman discloses in figure 1 an imaging system providing a high resolution scanning camera for scanning document images. In the high resolution scanning mode, the CCD is rotated over an object image in order to acquire a document image in a series of 32 image tiles and then the image tiles are stitched together to form a composite image (col. 5, lines 35-55). Figure 3A illustrates the tiling scheme of the invention. If optimum focus is obtained at a point on tile (310), then tile (301) will be out of focus (col. 8, lines 15-51). Thus, it can be seen that depending on the relative angle between the image capture device and the document scene to be scanned, certain tiles may be in and out of focus. Sussman states that a lens (22) is provided for each optical element (201-232) and each lens would correct the focal length disparity of each optical element (201-232) as a result of the relative angle between the optical element and the tile of the document (col. 8, lines 30-51). As an alternative, Sussman states that zoom elements may be inserted into the optical path between disk (32) and lens (20) to fully implement a zoom function and also to provide an extra motor-driven focus adjustment (24) (col. 9, lines 3-15). Therefore, it would have been obvious for one skilled in the art to have been motivated to implement a zoom function and a focus adjustment in combination when generating a composite image as disclosed by Sussman in the digital camera capable of performing image-stitching as disclosed by Mancuso. Doing so would provide a means for bringing objects on an object plane that are not flat and are to be included in a composite image into optimum focus (Sussman: col. 9, lines 10-13).

Re claim 11, Mancuso discloses a picture stitching camera (100) (col. 7, lines 15-19).

Re claim 16, see claim 10.

Re claim 20, see claim 11.

Re claim 3, the camera (100) includes a preview strip for analyzing the images and selecting a segment of the image for the compositor (col. 9, lines 1-24).

Re claim 4, the images are aligned and blended into the Panorama after each frame is acquired (col. 9, lines 19-24). Therefore, the registration of each of the images is identified with respect to one another (images are aligned).

Re claim 25, Mancuso discloses in figure 1 a digital still camera (100) capable of performing image stitching (col. 7, lines 16-19). The camera (100) includes a variable focus mechanism (optical lenses (102) for auto-focus) for capturing a series of images at different focus distances (col. 7, lines 19-23). The driver and actuator (104) serve as a controller to control the variable focus mechanism (102). The camera (100) takes a series of images (fig. 3: 300) and joins them together to form a panoramic image (col. 8, lines 33-36). Figure 21 is a detailed diagram of a picture-stitching device (124) shown

in figure 1. The picture-stitching device (124) shown in figure 21 includes a geographic mapping section (416) and an alignment preview section (2104) (col. 13, lines 41-65). Perspective correction is performed in the alignment preview section (2104) by correcting the perspective of the overlap region (2306) of the Previous Picture (2302) to conform with the perspective of the Current Picture (2304) (col. 14, lines 24-67; col. 15, lines 1-32.; fig. 23). Therefore, a perspective correction device (2104) determines a geometric transform to correct the image segments for perspective distortion. Figure 40 is a block diagram of the stitching and blending architecture (2110) of figure 21. It can be seen that an image compositor is used for compositing a perspective corrected image to which a geometric transform is applied (col. 22, lines 50-57; figs. 40 and 41). However, Mancuso fails to explicitly state that the apparatus includes a variable zoom mechanism for varying the zoom setting of the image capture device and a controller for controlling the different zoom settings. Although Mancuso discloses all of the above limitations he fails to distinctly state that the plural image segments that are sent to the image compositor are captured at different focus distances and zoom settings and that the focus settings and zoom settings are varied in combination. Additionally, Mancuso fails to state that the zoom settings are varied depending on the relative angle between the image capture device and a document scene to be captured.

Sussman discloses in figure 1 an imaging system providing a high resolution scanning camera for scanning document images. In the high resolution scanning mode, the CCD is rotated over an object image in order to acquire a document image in a series of 32 image tiles and then the image tiles are stitched together to form a

composite image (col. 5, lines 35-55). Figure 3A illustrates the tiling scheme of the invention. If optimum focus is obtained at a point on tile (310), then tile (301) will be out of focus (col. 8, lines 15-51). Thus, it can be seen that depending on the relative angle between the image capture device and the document scene to be scanned, certain tiles may be in and out of focus. Sussman states that a lens (22) is provided for each optical element (201-232) and each lens would correct the focal length disparity of each optical element (201-232) as a result of the relative angle between the optical element and the tile of the document (col. 8, lines 30-51). As an alternative, Sussman states that zoom elements may be inserted into the optical path between disk (32) and lens (20) to fully implement a zoom function and also to provide an extra motor-driven focus adjustment (24) (col. 9, lines 3-15). Therefore, it would have been obvious for one skilled in the art to have been motivated to implement a zoom function and a focus adjustment in combination when generating a composite image as disclosed by Sussman in the digital camera capable of performing image-stitching as disclosed by Mancuso. Doing so would provide a means for bringing objects on an object plane that are not flat and are to be included in a composite image into optimum focus (Sussman: col. 9, lines 10-13).

Claims 5-7, 17-19, and 28 rejected under 35 U.S.C. 103(a) as being unpatentable over Mancuso et al. in view of Sussman et al. and further in view of Herman et al. US 6,075,905.

Re claim 5, the combination of Mancuso and Sussman discloses all of the limitations of claim 3 above. However, the combination of Mancuso and Sussman fails to explicitly state that the image analyzer is operative to analyze the quality of a region of a captured image and select a segment of the region for the compositor according to the image quality of the segment.

Herman discloses in figure 1 a process for forming a mosaic image. The region selection portion (104) of the process for forming a mosaic image includes the selection of subregions of overlapping source images for inclusion in the mosaic (col. 5, lines 24-25). Automatic selection partitions the domain of the mosaic into subregions based on the quality of the image (col. 5, lines 24-35). Thus, the quality of different regions of the captured image is analyzed and segments are selected according to the image quality of the segment. Therefore, it would have been obvious for one skilled in the art to have been motivated to include the region selection portion (104) for selection regions based on the quality of the image as disclosed by Herman in the camera capable of generating a composite image from image segments of varied focus and zoom setting disclosed by Mancuso in view of Sussman. Doing so would provide a means for finding appropriate cut lines between neighboring images based on the quality of the image (Herman: col. 5, lines 32-35).

Re claim 6, Herman states that the quality is determined by motion blur (col. 5, line 35). Therefore, since image blur directly relates to image sharpness, the quality is also determined by sharpness.

Re claim 7, Herman states that the quality is determined by resolution (col. 5, line 35).

Re claim 17, the combination of Mancuso and Sussman discloses all of the limitations of claim 16 above. However, the combination of Mancuso and Sussman fails to explicitly state that the image analyzer is operative to determine the quality of plural image segments and select a segment of the region for the compositor according to the image quality of the segment.

Herman discloses in figure 1 a process for forming a mosaic image. The region selection portion (104) of the process for forming a mosaic image includes the selection of subregions of overlapping source images for inclusion in the mosaic (col. 5, lines 24-25). Automatic selection partitions the domain of the mosaic into subregions based on the quality of the image (col. 5, lines 24-35). Thus, the quality of different regions of the captured image is analyzed and segments are selected according to the image quality of the segment. Therefore, it would have been obvious for one skilled in the art to have been motivated to include the region selection portion (104) for selection regions based on the quality of the image as disclosed by Herman in the camera capable of generating a composite image from image segments of varied focus and zoom setting disclosed by Mancuso in view of Sussman. Doing so would provide a means for finding appropriate cut lines between neighboring images based on the quality of the image (Herman: col. 5, lines 32-35).

Re claim 18, Herman states that automatic selection finds appropriate cut lines between images based on location or quality (col. 5, lines 32-35). Therefore, the quality of each of the images is determined and identified.

Re claim 19, Herman states that the quality analysis includes analyzing resolution and blur (col. 5, line 35).

Claims 21 and 23 rejected under 35 U.S.C. 103(a) as being unpatentable over Mancuso et al. in view of Sussman et al. and further in view of Yokota et al. US 6,118,484.

Re claims 21 and 23, the combination of Mancuso and Sussman discloses all of the limitations of claims 10 and 20 above. Specifically, Sussman states that zoom elements may be inserted into the optical path between disk (32) and lens (20) to fully implement a zoom function and also to provide an extra motor-driven focus adjustment (24) (col. 9, lines 3-15). However, the combination of Mancuso and Sussman fails to explicitly state that the zoom settings are automatically inferred with a sensor of the camera.

Yokota discloses in figure 19 a video camera including an automatic focusing device. The camera includes a zoom encoder (215) that reads the zooming condition of the lens (212) (col. 11, lines 35-56). The examiner is reading the zoom encoder (215)

as a sensor that automatically infers the zoom settings of the camera. Therefore, it would have been obvious for one skilled in the art to have been motivated to include a zoom encoder for reading the zoom condition of a camera as disclosed by Yokota in the camera capable of generating a composite image from image segments of varied focus and zoom setting as disclosed by Mancuso in view of Sussman. Doing so would provide a means for obtaining a value of the current zooming condition of a camera (Yokota: col. 11, lines 39-41).

Claims 26 and 27 rejected under 35 U.S.C. 103(a) as being unpatentable over Mancuso et al. in view of Sussman et al. and further in view of Chen US 2001/0010546.

Re claim 26, the combination of Mancuso and Sussman discloses all of the limitations of claim 25 above. However, the combination of Mancuso and Sussman fails to explicitly disclose a sensor for inferring the relative angle between an image capture device and a document scene.

Chen discloses in figure 1 a virtual-reality camera capable of creating panoramic images. The camera includes an orientation/position sensor (21) capable of detecting the orientation and position of the camera relative to a fixed reference (page 2, paragraph 23). Therefore it would have been obvious for one skilled in the art to have been motivated to include the orientation/position sensor as disclosed by Chen in the camera capable of generating a composite image from image segments of varied focus

and zoom setting as disclosed by Mancuso in view of Sussman. Doing so would provide a means for automatically determine a spatial relationship between discrete images to be combined into a composite image (Chen: page 2, paragraph 23).

Re claim 27, Chen states that the orientation/position sensor (21) may be an accelerometer (page 2, paragraph 25).

Claim 28 rejected under 35 U.S.C. 103(a) as being unpatentable over Mancuso et al. in view of Sussman et al. further in view of Chen and further in view of Herman et al.

Re claim 28, the combination of Mancuso, Sussman, and Chen discloses all of the limitations of claim 26 above. However, the combination of Mancuso, Sussman, and Chen fails to explicitly state that the image analyzer is operative to determine the quality of plural image segments and select a segment of the region for the compositor according to the image quality of the segment.

Herman discloses in figure 1 a process for forming a mosaic image. The region selection portion (104) of the process for forming a mosaic image includes the selection of subregions of overlapping source images for inclusion in the mosaic (col. 5, lines 24-25). Automatic selection partitions the domain of the mosaic into subregions based on the quality of the image (col. 5, lines 24-35). Thus, the quality of different regions of the

captured image is analyzed and segments are selected according to the image quality of the segment. Therefore, it would have been obvious for one skilled in the art to have been motivated to include the region selection portion (104) for selection regions based on the quality of the image as disclosed by Herman in the camera capable of generating a composite image from image segments of varied focus and zoom setting disclosed by Mancuso in view of Sussman and further in view of Chen. Doing so would provide a means for finding appropriate cut lines between neighboring images based on the quality of the image (Herman: col. 5, lines 32-35).

Allowable Subject Matter

Claims 22 and 24 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fail to anticipate or render obvious the following technical features as recited in the highlighted claims:

Referring to claims 22 and 24, the prior art fails to teach or suggest automatically inferring the **zoom settings** of a camera with a sensor that is an accelerometer.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bender et al. (US 5,920,657) discloses a method of creating a high-resolution still image using a plurality of images. The information regarding combining images of variable zoom into a composite image is pertinent material.

Miyatake et al. (US 6,466,262) discloses a digital wide camera. The information regarding creating a panoramic image from a sequence of images of variable zoom is pertinent material.

Contacts

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly L. Jerabek whose telephone number is **(571) 272-7312**. The examiner can normally be reached on Monday - Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on **(571) 272-7308**. The fax phone

number for submitting all Official communications is 703-872-9306. The fax phone number for submitting informal communications such as drafts, proposed amendments, etc., may be faxed directly to the Examiner at **(571) 273-7312**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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